

Effects of Hurricane Harvey in San Antonio Bay-Hydrography data, Feb. 2017 - July 2019

Website: <https://www.bco-dmo.org/dataset/784614>

Data Type: Cruise Results

Version: 1

Version Date: 2019-12-18

Project

» [RAPID: Capturing the Signature of Hurricane Harvey on Texas Coastal Lagoons](#) (Hurricane Harvey Texas Lagoons)

Contributors	Affiliation	Role
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Abstract

The effects of Hurricane Harvey were studied. This dataset includes hydrographic measurements (temperature, salinity, oxygen, pH, refraction) from San Antonio Bay, northwest Gulf of Mexico estuaries along the Texas coast. They were taken during eleven quarterly sampling trips on a small boat, Feb. 2017 - July 2019.

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Coverage

Spatial Extent: N:28.39352 E:-96.68435 S:28.24618 W:-96.7724

Temporal Extent: 2019-01-09 - 2019-12-05

Dataset Description

The effects of Hurricane Harvey were studied. This dataset includes hydrographic measurements (temperature, salinity, oxygen, pH, refraction) from San Antonio Bay, northwest Gulf of Mexico estuaries along the Texas coast. They were taken during eleven quarterly sampling trips on a small boat, Feb. 2017 - July 2019.

Methods & Sampling

Hydrographic measurements were made at each station with a YSI 6600 multi-parameter instrument. The parameters were read from the digital display unit.

Data Processing Description

BCO-DMO Processing Notes:

- added conventional header with dataset name, PI name, version date
- renamed columns: DATE to date_local, Time to time_local
- added column for ISO_DateTime.UTC

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Data Files

File
hydrography.csv (Comma Separated Values (.csv), 32.87 KB) MD5:9f8451797d11f124593bb2157e8a0c9b Primary data file for dataset ID 784614

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Parameters

Parameter	Description	Units
Sta	Station Name	unitless
Latitude	Station latitude; north is positive	decimal degrees
Longitude	Station longitude; east is positive	decimal degrees
date_local	sampling date (local): yyyy-mm-dd	unitless
time_local	sampling time (local): HH:MM:SS	unitless
ISO_DateTime.UTC	Sample date and time (UTC); ISO formatted: yyyy-mm-ddTHH:MM	unitless
REFRACT	A measure from the Brix refractometer; used as a backup for the conductivity/salinity probe. Brix is a unit of measure and is nearly the same as salinity in parts per thousand (ppt).	brix
DEPTH	Depth of station	meters
TEMP	Temperature	degrees Celsius
SAL	Salinity	Practical Salinity Units
DOPCT	Dissolved Oxygen saturation percent	unitless
DO	Dissolved Oxygen concentration	milligrams/Liter
PH	pH	pH units
SECCHI	Secchi disk depth	meters
Z	Location in water column: either surface or bottom	unitless

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Instruments

Dataset-specific Instrument Name	YSI 6600
Generic Instrument Name	Multi Parameter Portable Meter
Dataset-specific Description	Used to measure temperature, conductivity, pH, dissolved oxygen.
Generic Instrument Description	An analytical instrument that can measure multiple parameters, such as pH, EC, TDS, DO and temperature with one device and is portable or hand-held.

Dataset-specific Instrument Name	
Generic Instrument Name	Secchi Disc
Generic Instrument Description	Typically, a 16 inch diameter white/black quadrant disc used to measure water optical clarity

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Deployments

TAMUCC-HRI

Website	https://www.bco-dmo.org/deployment/784611
Platform	small boat: TAMUCC
Start Date	2019-02-22
End Date	2019-07-09
Description	Eleven quarterly sampling trips to study impact of Hurricane Harvey. The vessel was as 25' Guardian.

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Project Information

RAPID: Capturing the Signature of Hurricane Harvey on Texas Coastal Lagoons (Hurricane Harvey Texas Lagoons)

Coverage: Northwest Gulf of Mexico estuaries on Texas Coast

NSF Award Abstract:

Hurricane Harvey made landfall Friday 25 August 2017 about 30 miles northeast of Corpus Christi, Texas as a Category 4 hurricane with winds up to 130 mph. This is the strongest hurricane to hit the middle Texas coast since Carla in 1961. After the wind storm and storm surge, coastal flooding occurred due to the storm lingering over Texas for four more days, dumping as much as 50 inches of rain near Houston. This will produce one of the largest floods ever to hit the Texas coast, and it is estimated that the flood will be a one in a thousand year event. The Texas coast is characterized by lagoons behind barrier islands, and their ecology and biogeochemistry are strongly influenced by coastal hydrology. Because this coastline is dominated by open water systems and productivity is driven by the amount of freshwater inflow, Hurricane Harvey represents a massive inflow event that will likely cause tremendous changes to the coastal environments. Therefore, questions arise regarding how biogeochemical cycles of carbon, nutrients, and oxygen will be altered, whether massive phytoplankton blooms will occur, whether estuarine species will die when these systems turn into lakes, and how long recovery will take? The investigators are uniquely situated to mount this study not only because of their location, just south of the path of the storm, but most importantly because the lead

investigator has conducted sampling of these bays regularly for the past thirty years, providing a tremendous context in which to interpret the new data gathered. The knowledge gained from this study will provide a broader understanding of the effects of similar high intensity rainfall events, which are expected to increase in frequency and/or intensity in the future.

The primary research hypothesis is that: Increased inflows to estuaries will cause increased loads of inorganic and organic matter, which will in turn drive primary production and biological responses, and at the same time significantly enhance respiration of coastal blue carbon. A secondary hypothesis is that: The large change in salinity and dissolved oxygen deficits will kill or stress many estuarine and marine organisms. To test these hypotheses it is necessary to measure the temporal change in key indicators of biogeochemical processes, and biodiversity shifts. Thus, changes to the carbon, nitrogen and oxygen cycles, and the diversity of benthic organisms will be measured and compared to existing baselines. The PIs propose to sample the Lavaca-Colorado, Guadalupe, Nueces, and Laguna Madre estuaries as follows: 1) continuous sampling (via autonomous instruments) of salinity, temperature, pH, dissolved oxygen, and depth (i.e. tidal elevation); 2) bi-weekly to monthly sampling for dissolved and total organic carbon and organic nitrogen, carbonate system parameters, nutrients, and phytoplankton community composition; 3) quarterly measurements of sediment characteristics and benthic infauna. The project will support two graduate students. The PIs will communicate results to the public and to state agencies through existing collaborations.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1760006

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